

The logo for ETRAN, featuring the word "ETRAN" in a stylized, white, sans-serif font. A long, thin, white curved line arches over the letters, resembling a signal or a stylized 'E'.

**ЗБОРНИК АПСТРАКТА И ПРОГРАМ
65. КОНФЕРЕНЦИЈЕ ЕТРАН и 8. КОНФЕРЕНЦИЈЕ ИЦЕТРАН**

**Proceedings of Abstracts and Program
8th Conference IcETRAN in conjunction
with the 65th ETRAN Conference**

Етно село Станишићи, Република Српска, 8 - 10. септембра 2021. године
Ethno Village Stanišići, Republic of Srpska, 8 - 10, September, 2021

The logo for IcETRAN, featuring the word "IcETRAN" in a stylized, white, sans-serif font. The letters are enclosed within a white, horizontal, oval-shaped border.

Електроника
Телекомуникације
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ЗБОРНИК АПСТРАКТА И ПРОГРАМ

65. КОНФЕРЕНЦИЈЕ ЕТРАН

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Београд, август 2021.

Electronics
Telecommunication
Computers
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Nuclear Technique

Program and Abstracts

8th International Conference on Electrical,
Electronic and Computing Engineering

IcETRAN 2021

In conjunction with the 65th annual meeting
of ETRAN Society

Etno willage Stanišići,
Republic of Srpska, Bosnia and Herzegovina
September 8 - 10, 2021

Belgrade, August 2021

BT11.3 A MEASURE OF SPASTICITY BASED ON THE EXPONENTIAL FIT OF THE KNEE JOINT TORQUE ESTIMATED FROM THE GONIOGRAM DURING THE PENDULUM TEST

*Antonina Aleksic, Institute of Technical Sciences of the Serbian Academy of Sciences and Arts, Serbia
Dejan B. Popović, Serbian Academy of Sciences and Arts, Serbia and Aalborg University, Aalborg, Denmark*

Pendulum test is a method to quantify the spasticity. We used the goniogram recorded during the pendulum test to estimate the knee joint torque based on the model which considers spastic reflex activity. We fitted the exponential curve $T_h = ae^{-bt}$ to the estimated knee joint torque to calculate the parameters a and b . We compared the scaled value $\log a/b$ with the modified Ashworth score. We used 8 sets of data collected in a clinical study with six complete paraplegic subjects. The comparison shows that the ratio a/b correlates with the MAS scores; thereby, can be used as a measure of spasticity. The advantage of using the ratio a/b is that this score is not rater dependent and that the scores are real numbers compared the MAS scores; thereby, providing better resolution of the level of spasticity.

BT11.4 MULTIPLE MEASUREMENTS BY A PENDULUM TEST IMPROVE THE SPASTICITY ASSESSMENT IN SCI SUBJECTS

*Nikola Babić, University of Belgrade, Serbia
Radoje Čobeljić, Clinic for Rehabilitation "Dr Miroslav Zotović", Serbia
Slađana Kostić-Smith, Serbia
Lana Popović Maneski, Institute of Technical Sciences of the Serbian Academy of Sciences and Arts, Serbia*

We present the variability of the spasticity scores during three consecutive days using the case series clinical study data with spinal cord injured (SCI) subjects. We assessed the spasticity by the Pendulum Test (PT) and Ashworth Scale (AS) scores. We measured the spasticity on the three consecutive days before and after the period of the treatment. Three subjects with SCI participated in the study. We found large variability from day to day. The PT score had more significant variability compared with the AS. The results suggest that the three consecutive testing by using the pendulum test and PT score on different days provide a better assessment of spasticity being essential in evaluating the treatment protocol

BT11.5 PROOF OF CONCEPT PLATFORM OF AN ELECTROTACTILE BRAIN COMPUTER INTERFACE

*Marija Novicic, School of Electrical Engineering, University of Belgrade, Serbia
Vera Miler-Jerković, Innovation Center, School of Electrical Engineering, University of Belgrade, Serbia
Olivera Đorđević, Faculty of Medicine, University of Belgrade, Serbia
Ljubica Konstantinović, Faculty of Medicine, University of Belgrade, Serbia
Andrej Savić, School of Electrical Engineering, University of Belgrade, Serbia*

The aim of this paper is to present the concept and feasibility test of an electrotactile BCI platform consisted of EEG device, electrical stimulation device of nerves/muscles and custom software platform for device control. The developed application comprised GUI for device settings and synchronization of signal acquisition and stimulation control. Experiments for validation of the platform included transcutaneous electrical stimulation at 2 positions on the forearm for inducing somatosensory evoked potentials in the EEG signals in parallel with the tactile attention task performed by the subject. Initial results show that we were able to successfully acquire SEP with our system and that the tactile attention task modified SEP components in a physiologically congruent manner.